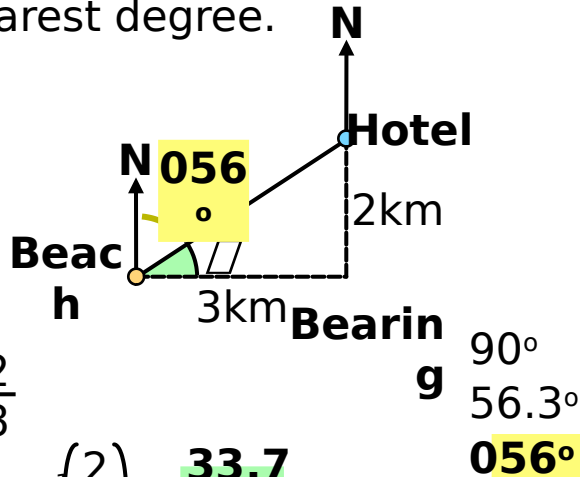


02/05/23

We are learning about: Bearings with trigonometry

Key terms: Adjacent, angle, bearing, cosine, degrees, length, opposite, side, sine, tangent

Ex1 A hotel is located 3km east and 2km north of the beach. Calculate the bearing of the hotel from the beach to the nearest degree.



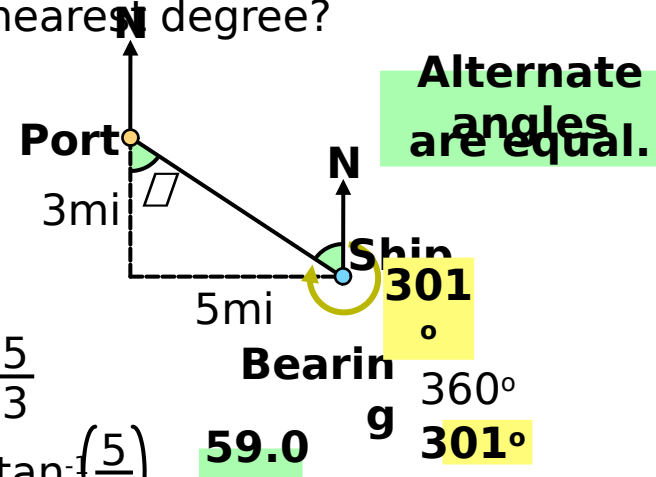
$$\tan() \quad \frac{2}{3}$$

$$\tan^{-1}\left(\frac{2}{3}\right) \quad 33.7^\circ$$

$$90^\circ - 33.7^\circ = 56.3^\circ$$

$$\text{Bearing} \quad 056^\circ$$

Ex2 A ship sets off from port. It sails 3 miles due south and then 5 miles east. On what bearing is the port from the ship to the nearest degree?



$$\tan() \quad \frac{5}{3}$$

$$\tan^{-1}\left(\frac{5}{3}\right) \quad 59.0^\circ$$

$$360^\circ - 59.0^\circ = 301^\circ$$

$$\text{Bearing} \quad 301^\circ$$

Alternate angles are equal.

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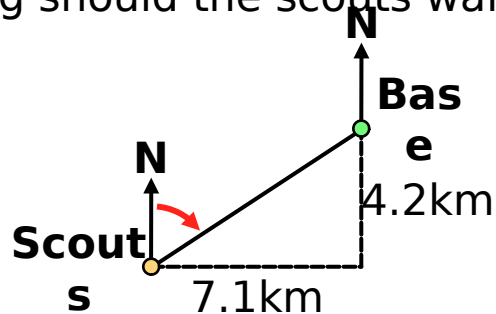
KEY TERMS

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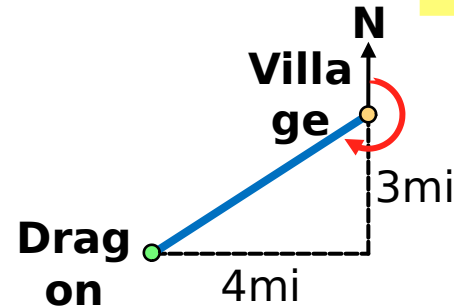
Q1 A scout troop are hiking in a forest. Starting from their base, they walk 4.2km south followed by 7.1km west. They want to walk the shortest distance back to the base. On what bearing should the scouts walk?



Q2 A dragon has been wreaking havoc in a local village. It is then chased away by a knight.

The dragon flies 3 miles due south followed by 4 miles due west towards the village.

[a] Work out the distance between the dragon and the village.
[b] Find the bearing of the dragon from the village to the nearest degree.



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KEY TERMS

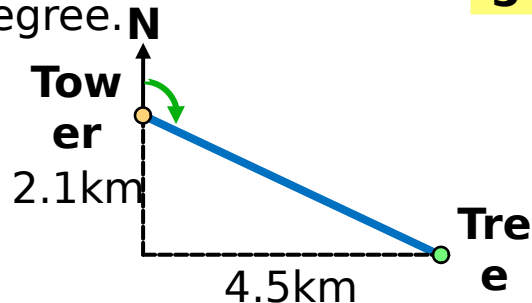
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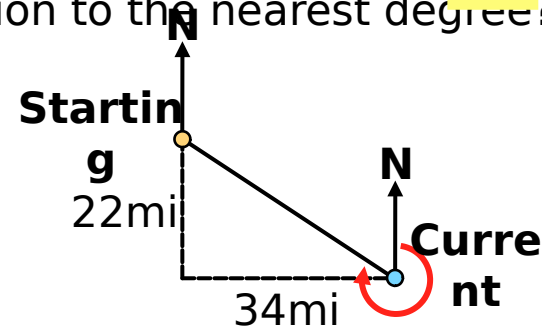
Key terms: Adjacent, angle, bearing, cosine, degrees, length, opposite, side, sine, tangent

Q3 The diagram shows the positions of a tower and a tree. The tree is 2.1km South of the tower and 4.5km East of the tower. **Work out the distance between the tower and the tree to one decimal place.**

a) **Work out the bearing of the tree from the tower to the nearest degree.**



Q4 A aeroplane flies 22 miles due south followed by 34 miles due east. On what bearing is the aeroplane's starting position from its current position to the nearest degree?



KEY TERMS

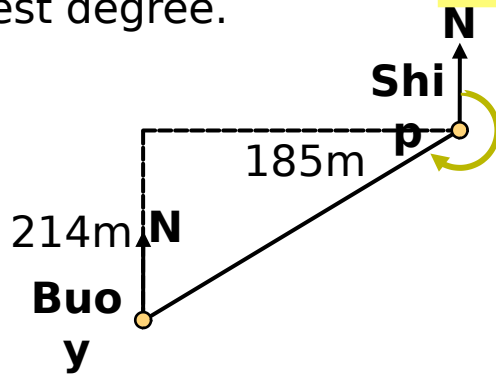
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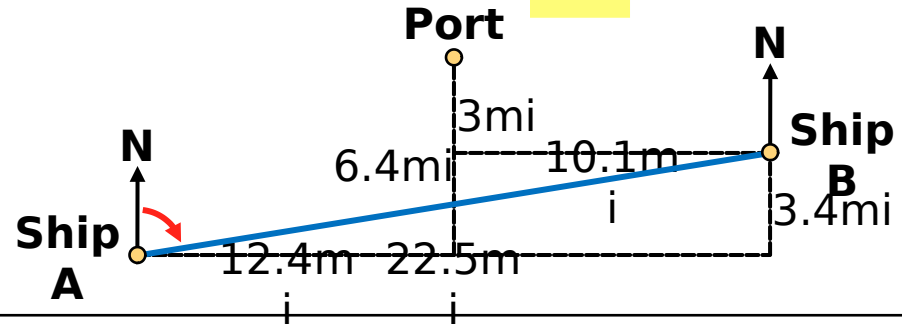
We are learning about: Bearings with trigonometry

Key terms: Adjacent, angle, bearing, cosine, degrees, length, opposite, side, sine, tangent

Q5 A buoy is located 214m west and 185m south of a ship. Calculate the bearing of the buoy from the ship to the nearest degree.



Q6 Two ships sail away from port. Ship A sails 6.4miles due south followed by 12.4miles due west. Ship B sails 3miles due south followed by 10.1miles due east. **[a]** Work out the distance between the two ships to one decimal place. **[b]** Work out the bearing of Ship B from Ship A to the nearest degree.



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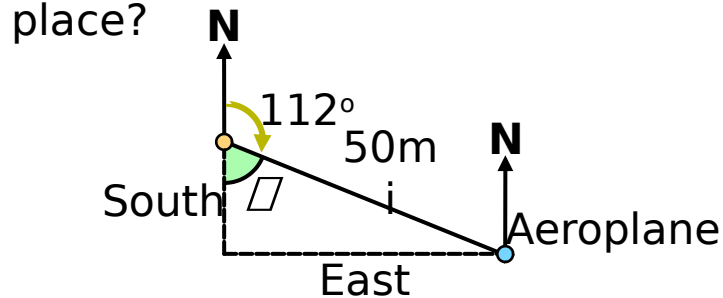
KEY TERMS

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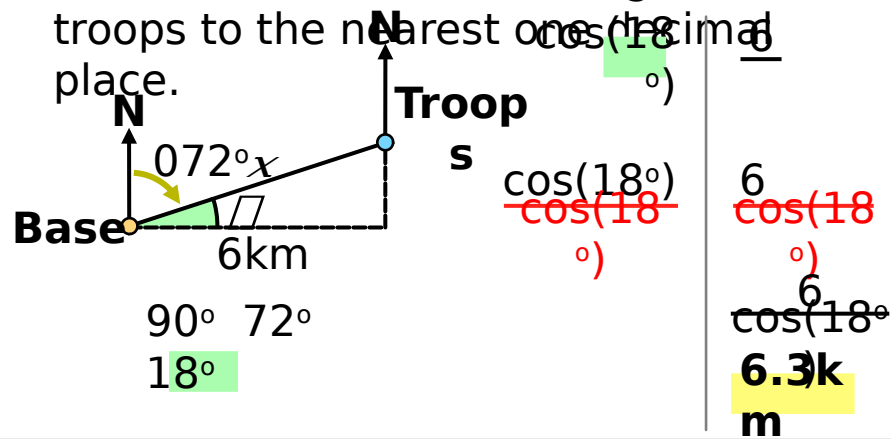
Key terms: Adjacent, angle, bearing, cosine, degrees, length, opposite, side, sine, tangent

Ex3 An aeroplane flies 50 miles on a bearing of 112° . How far due East has it travelled to the nearest one decimal place?



$$\begin{array}{l} 180^\circ - 112^\circ = 68^\circ \\ \text{East} \end{array} \quad \begin{array}{l} \sin(68^\circ) \\ 50 \sin(68^\circ) \end{array} \quad \begin{array}{l} \text{East} \\ 50 \\ \text{East} \\ \text{t} \end{array} \quad \begin{array}{l} 46.4 \\ \text{miles} \end{array}$$

Ex4 Ground troops are on a bearing of 072° from their base. They know that they are a distance of 6km due East of the base but don't know their distance due North. Work out the shortest distance between the base and the ground troops to the nearest one decimal place.



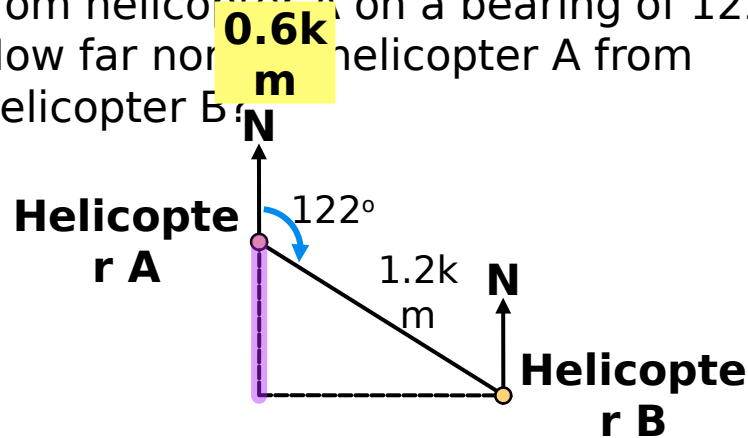
$$\begin{array}{l} \cos(18^\circ) \\ 6 \cos(18^\circ) \end{array} \quad \begin{array}{l} 6 \\ \cos(18^\circ) \\ 6 \\ \cos(18^\circ) \end{array} \quad \begin{array}{l} 6.3 \\ \text{km} \end{array}$$

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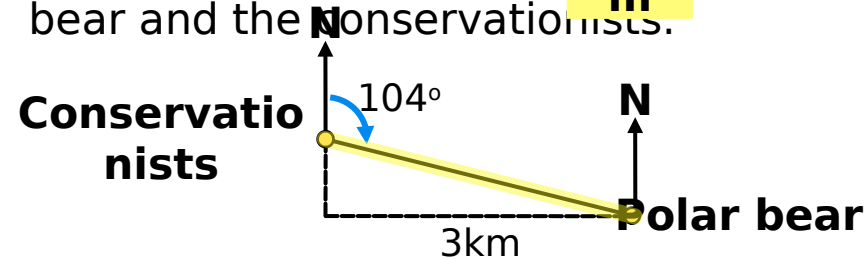
KEY TERMS

Key terms: Adjacent, angle, bearing, cosine, degrees, length, opposite, side, sine, tangent

Q1 The following diagram represents the positions and bearings of two helicopters. Helicopter B is 1.2km away from helicopter A on a bearing of 122° . How far north of helicopter A is helicopter B?



Q2 Animal conservationists are tracking the position of a polar bear. The polar bear's position is 3km in an eastward direction and is on a bearing of 104° . What is the shortest distance between the polar bear and the conservationists?



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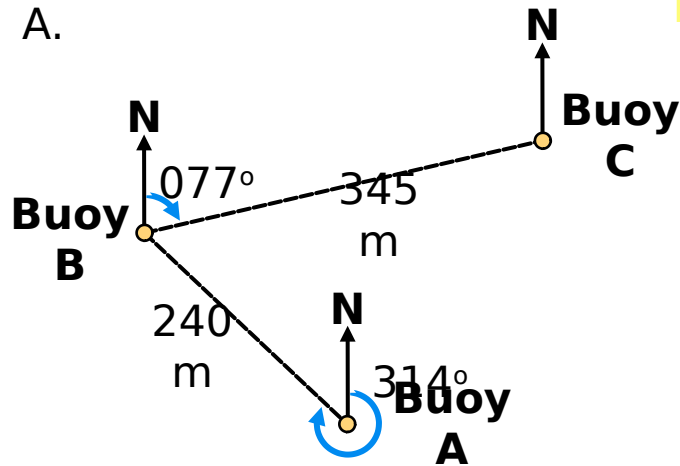
Key terms: Adjacent, angle, bearing, cosine, degrees, length, opposite, side, sine, tangent

Q3 The following diagram represents the positions and bearings of three buoys floating in the ocean.

[a] How far west is Buoy B from Buoy A?

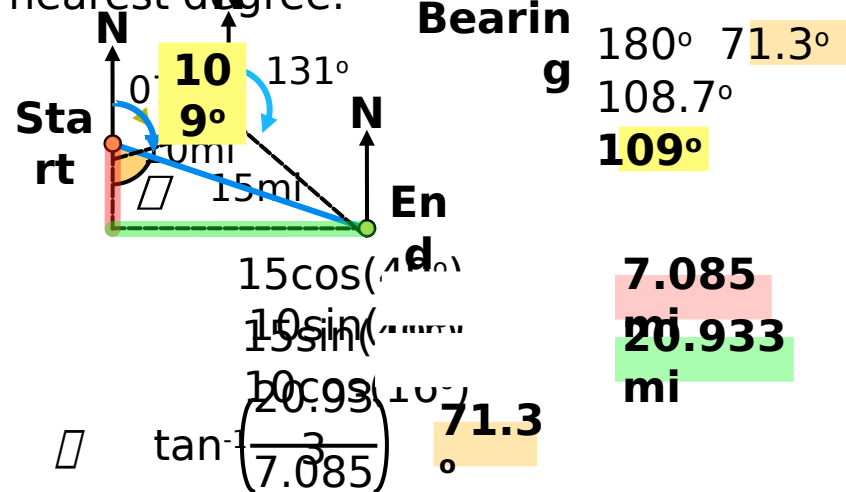
[b] How far east is Buoy A from Buoy B?

[c] How far north is Buoy C from Buoy B?



336.1
172.6
244.3
m

Q4 A ship sails on a bearing of 074° for 10 miles followed by a bearing of 131° for 15 miles. Work out the bearing of the ship from its starting position to the nearest degree.



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KEY TERMS